Retro Fi

User Guide

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Introduction

Thank you for choosing Waves! To get the most out of your new Waves plugin, please take a moment to read this user guide. To install software and manage your licenses, you need to have a free Waves account. Sign up at www.waves.com. With a Waves account you can keep track of your products, renew your Waves Update Plan, participate in bonus programs, and keep up to date with other important information.

We suggest that you become familiar with the Waves Support pages: www.waves.com/support. There are technical articles about installation, troubleshooting, specifications, and more. Plus, you'll find company contact information and Waves Support news.

Waves Retro Fi

Every generation of music has its distinctive sound: a combination of the recording conventions of the era and the audio technology of the time. When we listen to recordings from the '70s, they do not sound like those from the '50s, and a recoding made in 2020 sounds vastly different than one from 1920. And after forty or fifty years (or more), the record, tape, or other format, has been through a lot, so its problems are even greater than when it was created. Retro Fi takes your track and makes it sound like a recording from way back when—as it would sound *today*—with the artifacts that come from cassette copies of cassette copies, dodgy turntables, "who needs a ground?" setups, or any number of other curses.

The Retro Fi effect can range from surgical, such as giving an instrument a specific "period" sound, to a broad effect—planting your entire mix at a chosen time in the past. Retro Fi is quick to learn and easy to use, but it is very powerful. It has distinct, accurate setups that match the signature equalization, dynamics, noise, and mechanical distortion—as well as taste—of past decades. You can also create your own sonic time machine to put your mix in a unique and undefined time in the past. Retro Fi is not just about audio nostalgia, it's about making music sound modern by making it sound old.

Quick Start

The fastest way to get started is to use the presets. A good preset does most of the work for you. You may have to make some adjustments, but you'll be off to a good start. By experimenting with presets, you'll hear how different settings influence the overall effect. This helps you learn just what each control does.

Use the bar at the top of the plugin to save and load presets, compare settings, undo and redo steps, and resize the plugin. To learn more, click the icon at the upper-right corner of the window and open the WaveSystem Guide.

1. Click the arrow in the Toolbar (circled in yellow) to open the Presets drop-down menu. Select a preset whose name is closest to the effect you're looking for.
2. If you're not happy with the effect, try another preset before you start turning knobs.
3. Once you find the right preset, you'll probably want to make adjustments. There are a few controls that let you quickly adjust the "soul" of the effect without unraveling the preset, so start with these:

Module	Initial Controls	Effect
Device	Tone	Balance between the high- and low-frequency impulse responses.
Space	Mix	Adjust wet/dry mix of echo and reverb module vs. dry signal.
Noise	Drop-down menu	Select a noise type—this choice greatly affects the effect!
Mechanics	Wow, Wobble, Speed	Create mechanical playback irregularities.

Once you have these four controls working for you, experiment with other controls. There's nothing like turning knobs to learn how Retro Fi works, so the rest of this user guide provides in-depth information about each control.

We highly recommend that as soon as you find a sound you like, save your settings as a User Preset. The best effect ever is the one you didn't save. Next time, save a preset.

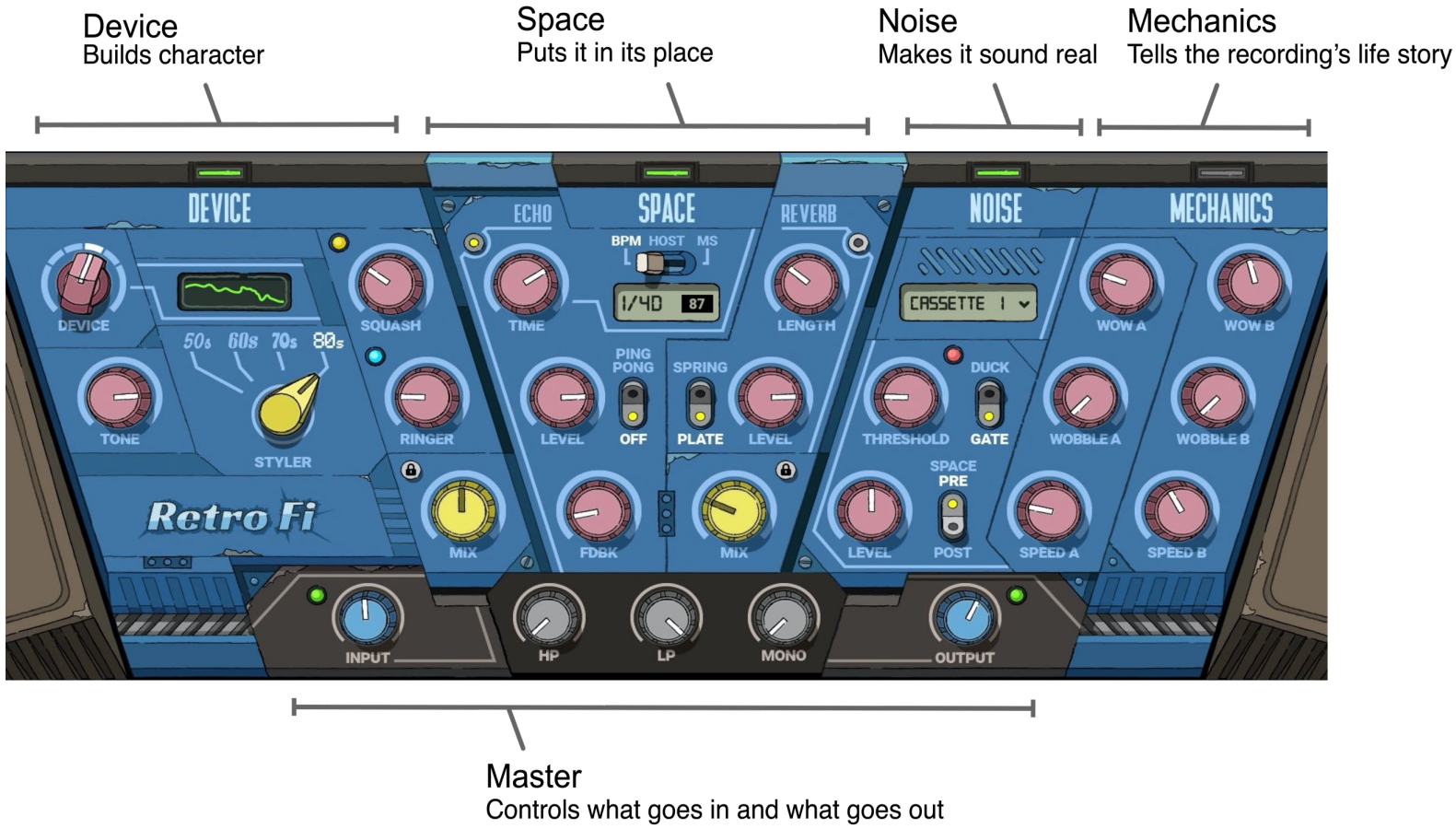
Interface and Controls

Components

There are three Retro Fi modules: mono, mono-to-stereo, and stereo.

Sections

The Retro Fi interface is made up of five sections, each of which plays a unique part in making your recording sound old. Usually, no single module creates the entire effect; it's the interaction between these very different tools that makes Retro Fi so effective.



Controls

Module On/Off (all modules)

Click the small switch at the top of a module to turn it on or off. This helps you to isolate what you're doing. A green LED indicates that the module is active.

Display Values

When you use a control or hover over it, its value is displayed.

Internal processing is carried out at 16-bit, 44.1 kHz sampling. The signal is re-sampled to its original format at the output of the plugin.

Device Module

The Device module establishes the overall character of the sound before you add reverb and echo, noise, and other effects. You can control its basic personality, tell it what decade it's from, change its dynamics, and torture it with digital clipping distortion.

Device

Use the Device control to select a sound model that will serve as the starting point for RetroFi processing. Each step in this four-position knob activates a combination of impulse responses (IR)—one low-frequency, and one high frequency—that define the source sound. When the knob is turned fully to the left, the sound is typically bright and airy. As you turn to the middle position and beyond, the sound becomes deeper and duller. The last step is a flat IR. This allows you to use the Squash and Ringer controls without including the strong coloration brought on by the first three IRs.

These controls are not shelves or low-pass/high-pass filters; instead, they are snapshots of different acoustic interactions with the input signal. So, even though it sounds bad, it sounds bad in an elegant way.

The small panel shows the average of the high and low IRs for the current Device setting.

Tone

This is a phase-aligned mix between the selected high-frequency and low-frequency IRs in the current Device setting. This is more important than you might think, so spend some time with this control.

Squash

A single knob controls a compressor and an expander. The Squash LED indicates the mode:

Orange LED Values from 0 to -10 result in downward compression.

Green LED Values from 0 to +10 result in upward expansion.

Twelve o'clock (a value of 0), is the neutral position; there is neither compression nor expansion.

Ringer

This ring modulator creates digital clipping distortion. Higher values mean more clipping, with more high frequencies in the clipped part of the signal.

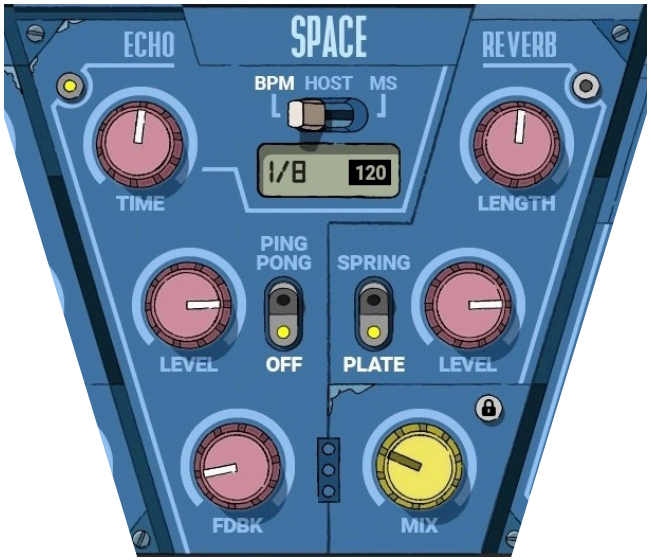
A steady blue LED indicates that the Ringer is engaged.

Styler

The Styler lets you select between typical recording and playback textures of previous decades: ’80s, ’70s, ’60s, and ’50s. Each setting reproduces frequency limiting, dynamic limiting, and distortion typical of recordings from those decades. These models reflect period recording technology, as well as the wear and tear that you’d expect to hear when listening to an old recording on your modern system.

Mix

This is the mix of the dry plugin input and the output of the Device module.



Space Module

The Space module combines two types of reverb with an echo processor. The echo can be synchronized to a DAW or controlled independently.

Echo Panel

Time

Shows the delay time value. In MS Sync mode, time is shown in milliseconds. In Host and BPM Sync modes, time is shown in note units. Values can be set using the mouse and the keyboard up/down arrows. Use the three-position switch to select a time mode.

- **BPM** (syncs to a manual user setting, in BPM)
- **Host** (syncs to the host application BPM setting) In Host mode, the BPM control is disabled.
- **MS** (allows manual setting, in milliseconds)

Range**:** 1 to 3500 ms or BPM multiple (e.g. 1/4 note, 1/8 note, 1/16 note, etc.)

When switching from MS mode to BPM mode (or vice versa), the display will show the nearest approximate value. Time value is shown in the box below.

Echo Level

Sets the level of an initial echo. If Feedback is used, the level of each echo will diminish over time.

Ping Pong

Determines whether the echoes are moving side-to-side or are stationary.

On The echoes move from side to side.

Off The echoes are stationary in the center of the image.

FDBK (Feedback)

Controls the number of repeating echoes by returning them through the echo module. Echo loudness is reduced with each cycle through the Echo processor. A value of 100 results in infinite feedback.

Mix

This is the mix of the dry plugin input and the output of the Device module. Since the Space module is fed from the output of the Device module, the Space “wet” signal is a combination of the Device mix out and the Space processors. This makes the Device mix and Space mix controls very powerful tools.

REVERB PANEL

Reverb Level

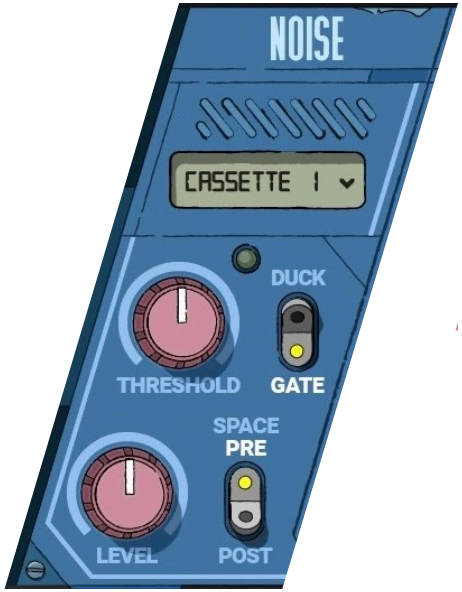
Controls the level of the reverb tail.

Reverb Length

Adjusts the length of the reverb tail.

Spring vs. Plate

Choose between two types of reverbs. “Spring” reverbs are generally more percussive sounding, like putting the sound in a tin can. “Plate” reverbs are usually denser, along the lines of an empty warehouse.



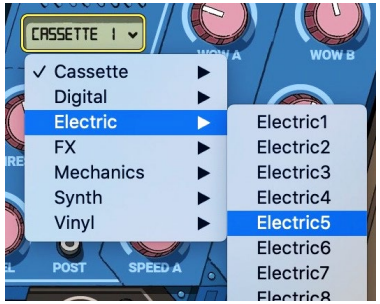
NOISE MODULE

Noise is a vital part of the Retro Fi effect. It helps define the origin and history of the recording, and it influences the listener’s perception of the processing in the Retro Fi and Space modules.

The Noise Module includes a library of noise types. You can apply dynamics processing to the selected noise and choose the routing of the module’s output signal.

Noise Type

This drop-down menu provides a varied collection of noise sounds. There are 64 WAV noise files from several categories:



Open the drop-down menu and select a noise sample.

The noise files range in lengths of up to two seconds. To avoid a discernable loop sound, an algorithm interprets noise sample and plays it in a way to avoid a repetitive sound.

Noise Dynamics Panel

Use this panel to control the dynamic behavior of the noise with respect to the input signal.

Ducker/Gate

This two-way switch sets the dynamics mode:

- **Ducker** As the input signal increases, the noise level lowers. The noise is at its greatest level when there is little or no input signal.
- **Gate** As the input signal increases, the noise level will also increase. The noise is at its greatest level when the input signal is high.

If you do not want dynamics processing of the noise signal, set the Threshold control to -60 dB.

Threshold

The input signal is used as a sidechain to activate the Ducker and the Gate. The Threshold knob sets the threshold level of the sidechain. When the knob is set to its midpoint position, the Ducker or Gate behave in the default mode for each selected noise profile—it's where we recommend you begin.

A three-LED meter indicates activity.

- Green indicates an acceptable level.
- Yellow means you're pushing it, but you'll probably be okay.
- If the indicator is red, back off.

Space Pre/Post

This switch sets where the output of the Noise module is routed: before or after the Space Module.

Older mic preamps tend to produce more noise than their modern equivalents. This means that noise exists from the very beginning of the recording chain, so echo and reverb applied down the line will be applied to the noise, as well as to the signal. This may, or may not, be what you want to do. Pre/Post lets you choose where you want to insert the noise.

- **Pre** The output of the Noise section is inserted before the Space module. This is akin to adding noise from the preamp. Noise will thus be part of the echo and reverb chain. In this mode, noise is affected by the Device and Space modules.
- **Post** The output of the Noise section is inserted after echo and reverb. It is not part of reverb and echo processing, so it doesn't influence those calculations, nor can it appear in the echo or reverb.

Level

Controls the output of the Noise sent to the Space section (Pre) or the plugin output (Post).

Mechanics Module

The Mechanics module lets you control the mechanical artifacts that are common to most old analog recordings.

Old recordings have been through a lot. Remember spooling a tape back into the cassette after it went nuts while rewinding it, or leaving it in the car…in the summer, or putting a coin on your tone arm so that it would "track better," or any number of indignities that you subjected your recordings to? These things leave a mark on the recording.

The Mechanics module adds these telltale problems that inevitably show up when you listen to old analog recordings. It's the final step in making the track really sound like it's not from today.

There are two identical sets of controls: **Wow**, **Wobble**, and **Speed.** Wow and wobble are present in any analog recording and any mechanical playback system. They are the result of inconsistent playback speed—and, at times, speed inconsistencies during production.

Wow is a variation in pitch, usually caused by irregular playback speed.

Wobble an amplitude variation: the signal gets louder and quieter, usually at a predictable rate.

A new, high-end turntable or tape player will give you very acceptable wow and wobble. But as belts and bearings get old, and as the record or tape shows some wear, pitch and amplitude may become less consistent. Use the Wow and Wobble controls to recreate these inaccuracies.

Speed is the modulation speed of the Wow and Wobble effects.

Controls A and B

The two sets of controls in the Mechanics module are the same, but their functions vary somewhat. Wow A, Wobble A, and Speed A address artefacts commonly associated with cassette tape, while Wow B, Wobble B, and Speed B focus on the type of problems found in vinyl recordings. This does not mean that you should use one set of controls specifically for one type of effect and one for the other. Mix, match, and use whatever combination works for you. The cassette/vinyl generalization is there only to help you get started.

Master Section

The Master section controls the input and output of the plugin. It also controls output HP and LP filters and the width of the stereo image.

Input controls the level of the input of the plugin. Make sure that you are sending an appropriate level from the DAW. *Output* sets the level of the signal returned to the DAW.

LP and *HP* filters reduce the frequency range at the output of the plugin.
Range—HP: 30 Hz to 1500 Hz, LP: 15,000 Hz to 21,000 Hz

Mono narrows the width of a stereo image. 10 = original stereo image; 0 = width reduced to mono.

Level Indicators

Level is indicated by LEDs next to the input and output controls.

Green	signal is present, but the level should be higher
Yellow	desired signal level
Red	clipping.

An occasional red LED is not necessarily a problem; constant red means that the signal is too loud, and clipping may become audible. In this case, lower the level.